

## **REMARKS**

The following remarks are provided in response to the Office Action (“office action”) mailed June 17, 2008 in which the office action:

- rejected claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 33-35 and 37-42 under 35 U.S.C. §103(a) as being unpatentable over WO99/043023 – US 6,372,581 to Bensahel et al. (hereinafter Bensahel).
- rejected claims 10, 11, 29, 30 and 32 under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of US Pub. 2002/0197884 to Niimi et al. (hereinafter Niimi).
- rejected claims 18-22 and 36 under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of US Pub. 2002/0119674 to Thakur (hereinafter Thakur).

The Applicants respectfully request reconsideration of the above referenced patent application for the following reasons:

### **Claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 33-35 and 37-42 rejection under 35 U.S.C. §103(a)**

Claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 33-35 and 37-42 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bensahel. The Applicants herein amend independent claims 1, 8, 12, 24 and 38 to include the elements of claims 33, 34, 35, 37 and 40, respectively. **No new subject matter has been added to the claim set.**

Claims 33-35, 37 and 40 are herein canceled without prejudice. The Applicants respectfully request reconsideration of claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31,

38-39 and 41-42 in view of the amendments and the following arguments.

Independent claim 1 has been amended and now includes the element, “incorporating nitrogen into a dielectric film using ammonia ( $NH_3$ ) gas in a rapid thermal annealing process, wherein an ultra-low pressure equal to or less than about 10 Torr is used for the rapid thermal annealing process.” Independent claims 8, 12, 24 and 38 each include a similar element.

Bensahel fails to disclose “incorporating nitrogen into a dielectric film using ammonia ( $NH_3$ ) gas in a rapid thermal annealing process, wherein an ultra-low pressure equal to or less than about 10 Torr is used for the rapid thermal annealing process.”

Nonetheless, the office action asserts that because rapid thermal annealing and ammonia are each disclosed in separate sections of Bensahel, then Bensahel discloses “incorporating nitrogen into a dielectric film using ammonia ( $NH_3$ ) gas in a rapid thermal annealing process.” (See office action, p. 5, first paragraph.) Regarding the recited pressure range, the office action states that, “*the ultra-low pressure is taught in the abstract of Bensahel et al.*” (See office action, p. 7, third-to-last paragraph.)

However, contrary to the position taken in the office action, Bensahel fails to disclose “*an ultra-low pressure equal to or less than about 10 Torr is used for [a] rapid thermal annealing process.*” Citing MPEP § 2131.03,

“When the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." What constitutes a “sufficient specificity” is fact dependent. If the claims are directed to a narrow range, and the reference teaches a broad range, depending on the

other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. See, e.g., *Atofina v. Great Lakes Chem. Corp*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006) wherein the court held that a reference temperature range of 100-500 degrees C did not describe the claimed range of 330-450 degrees C with sufficient specificity to be anticipatory." (Emphasis added.)

Bensahel does disclose an annealing process with "*a pressure level  $\leq 10^4$  Pa.*" (See Bensahel, Abstract.) That is, Bensahel discloses a pressure range of less than or equal to approximately 100 Torr. However, Bensahel fails to recognize or appreciate the benefits of using a much narrower pressure range at the lower end of the range of less than or equal to approximately 100 Torr. Specifically, as the Applicants point out, high pressure is considered to be around 100 Torr and, instead, teach and claim using an ultra-low pressure equal to or less than about 10 Torr. (See Applicants' specification, e.g., paragraph 0033.) Thus, the range disclosed in Bensahel covers both high pressure and low pressure values. Accordingly, although the range of equal to or less than about 10 Torr (Applicants' claimed range) falls within the range of less than or equal to 100 Torr (Bensehal's disclosed range), like the holding in *Atofina v. Great Lakes Chem. Corp*, Bensahel does not describe the claimed range of "equal to or less than about 10 Torr" with sufficient specificity to be anticipatory. As such, Bensahel fails to disclose "*an ultra-low pressure equal to or less than about 10 Torr [for a] rapid thermal annealing process,*" as taught and claimed by the Applicants.

Additionally, with respect to claims 9, 19 and 28, Bensahel fails to disclose using "*a temperature between about 900-1100°C.*" Bensahel discloses annealing with nitric oxide "*at a temperature at most equal to 700°C,*" which is outside of the claimed range.

(*See* Bensahel, col. 1, lines 61-62. Emphasis added.) Furthermore, Bensahel teaches away from using “a temperature between about 900-1100°C” because Bensahel discloses that temperatures as high as 850-900°C are undesirable. (*See* Bensahel, col. 1, lines 41-45.) As such, **Bensahel both fails to disclose, and teaches away from, using “a temperature between about 900-1100°C.”** as taught and claimed by the Applicants.

Accordingly, the Applicants respectfully request the Examiner to remove the rejection of claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 38-39 and 41-42.

#### **Claims 10, 11, 29, 30 and 32 rejection under 35 U.S.C. §103(a)**

Claims 10, 11, 29, 30 and 32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of Niimi. Claims 10 and 11 depend from independent claim 8. Claims 29, 30 and 32 depend from independent claim 24. The Applicants respectfully request reconsideration of claims 10, 11, 29, 30 and 32 in view of the amendments and above arguments regarding independent claims 8 and 24.

#### **Claims 18-22 and 36 rejection under 35 U.S.C. §103(a)**

Claims 18-22 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of Thakur. Independent claim 18 has been amended to include the element of claims 36, a similar element to amended independent claim 1, as described above. Claim 36 is herein canceled without prejudice. Thakur fails to cure the deficiencies of Bensahel pointed out with regard to claim 1. Accordingly, the Applicants respectfully request reconsideration of claims 18-22 in view of the amendments and

above arguments.

## **CONCLUSION**

The Applicants submit that they have overcome the office action's rejections of the claims and that they have the right to claim the invention as set forth in the listed claims. The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Pursuant to 37 C.F.R. 1.136(a)(3), the Applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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Date

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